

A Nonsurgical Treatment in Anterior Open Bite – Case Report

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Abstract:

Successful treatment of the adult patient with an open bite dental or skeletal pattern often presents a difficult challenge. While the causes of open bite may be multifactorial in nature, there are specific diagnostic criteria that may allow for an orthodontic treatment modality incorporating extraction therapy with retraction of incisors. This case presentation illustrates treatment of adult patients with open bites due to proclined incisors.

Keywords: anterior open bite, malplacement, orthognathic surgery, camouflage.

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INTRODUCTION:

Successful treatment of the adult patient with an open bite dental or skeletal pattern often presents a difficult challenge in orthodontics. The causes of open bite may be multifactorial in nature. However, there are specific diagnostic criteria that may allow for an orthodontic treatment modality incorporating extraction therapy with retraction of incisors. Although the selection of extraction therapy for correction of anterior open bite has a narrow range of application in the overall scheme of open bite treatment, this treatment method has certain areas of application in which success may be anticipated.¹

This case presentation illustrates treatment of adult patients with open bites with bi-maxillary protrusion. The diagnostic criteria and mechanics for appropriate and successful treatment are discussed for the case. Patient selection and treatment principles for nonsurgical open bite treatment are discussed, and a review of various methods of treatment for the skeletal open bite is presented. Post-treatment stability and retention concerns are addressed.²

The open bite malocclusion can be described as dental and skeletal. Proper differentiation is essential in determining the appropriate corrective measures. Dental open bites are generally more responsive to treatment with orthodontics alone, whereas skeletal open bites often require a combination of orthodontics and orthognathic surgery.

The treatment of patients with anterior open bite is one of the more challenging aspects of orthodontics. Among the etiologic factors in an open bite is (1) a morphogenetic abnormality resulting in a disturbance of skeletal development, (2) an expression of muscle growth and muscle function, and (3) displacement of anterior teeth.^{1,2}

Successful orthodontic therapy necessitates a careful appraisal of the etiologic factors, an accurate determination of where the skeletal and dental abnormality exists, an accurate appraisal of the individual growth pattern, and, finally, the development of an individualized treatment plan to address this factors.^{1,2}

CASE REPORT:

The patient, 22 years three months of age, visited our department OPD (Fig. 2). The patient exhibited a dolichocephalic facial type with upturned nares and mentalis activity secondary to lip strain to achieve oral closure. His profile was characterized as retrognathic convex with an associated increased lower anterior face height. The lips were incompetent at rest, while the lower lip was everted, forming a deep sub labial furrow. There was an obtuse nasolabial angle attributable to the small upturned nose.

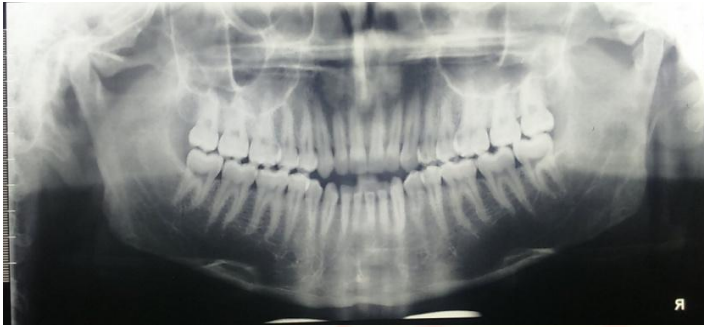


Fig.1 Pretreatment OPG



Fig.2 Pre-treatment intra and extra oral photographs.

The upper and lower incisors were proclined and super-erupted relative to their respective skeletal bases and were positioned well ahead of the skeletal profile. Both the maxillary and the mandibular molars demonstrated excessive vertical alveolar development.³

The dental examination demonstrated a Class I molar relationship, right and left, with 2 mm of reverse over jet and 2.5 mm of anterior open bite. The mandibular dental midline was located to the left of the skeletal midline by 1 mm (Fig.1, 2).

TREATMENT OBJECTIVES

The primary treatment objectives were to correct the anterior open bite and molar relationship, achieve normal over jet and overbite and also improve the facial aesthetics. The treatment objectives were to establish good functional and stable occlusion and to improve the smile as well as improve speech pronunciation.

TREATMENT ALTERNATIVES

The combination orthodontic surgical treatment plan was discussed with patient involving bi-jaw surgery, but the patient refused to go for surgery. The alternative treatment plan was orthodontic camouflage treatment by extracting all first bicuspid and patient was favourable with the same plan.

PROGRESS OF TREATMENT

The patient asked to be treated nonsurgically if possible. He was told surgical approach also but refused. The primary objective of the treatment was to close the anterior open bite by molar intrusion, allowing the mandible to be repositioned upward and forward. Treatment was also aimed at the reduction of the maxillary and mandibular dental protrusion, midline correction, and alignment of teeth. Arch length necessary to reduce the maxillary and mandibular dental protrusion and to correct the midlines was gained through extraction of the upper first premolar and the lower first premolar and through the up righting of mesially tipped molars.

Treatment was initiated in the maxillary and mandibular arch. The right and left first premolars were extracted and 0.022" MBT appliance bonded and 0.016" NiTi arch wires placed and cinched back. Extraction of the maxillary right first premolar allowed correction of the maxillary midline and

reduced dental protrusion (Fig.3). Canine retraction was completed with the MBT mechanics on 19x25" stainless steel wire. Incisor retraction was completed with closing loop mechanics, since vertical control is an important factor in retention of an open bite case characterized by excessive dental alveolar development. Settling elastics were used in the final stage on 21x25" stainless steel wire (Fig.3). Retention was initiated with ten days of full-time wear followed by night-time wear only.⁴



Fig.3 settling elastics with 21x25" stainless steel wire.

TREATMENT RESULTS

The anterior open bite was eliminated through upward and forward mandibular rotation secondary to molar intrusion. Previously tipped molars were up righted to a normal position in the dental arch. The posterior extractions allowed the case to be finished with a solid Class I molar and canine relationship and ideal over jet and overbite (Fig.4). With regard to the profile consideration, lip strain on closure appeared to be reduced. The oral tissues appeared to be healthy, with no areas of decalcification or periodontal inflammation.

The retention intraoral photographs show the resulting occlusion. The maxillary right and left second molars were not in solid occlusion at the time of retention. Denture relationships were also significantly influenced.



Fig.4 Post-treatment intra and extra oral photographs

DISCUSSION

The patient with an anterior open bite has one of the most difficult orthodontic problems to correct. The cause of the anterior open bite may be both complex and difficult to establish and yet is critical in developing a treatment regimen that will produce stability and satisfactory cosmetic results. Although normal faces are different for the various racial groups, cephalometric standards are available for both blacks and whites.¹⁻³ However, our knowledge largely represents the white population⁵

The treatment planning of patients with anterior open bite raises as many problems as determining the cause. Hellman⁵ (in 1931) and Nahoum⁶ (in 1974) found as many successes as there were failures in the treatment of open bite cases. In 1969, Richardson⁷ stated that the prognosis for these cases was either good or poor. In 1971, Kim⁸ reported that the state of cephalometric analysis and knowledge of the subject was inadequate to diagnose an open bite or deep bite tendency.

CONCLUSION

We have presented a case in which an adult skeletal open bite was treated nonsurgically. The treatment resulted in an aesthetic, functional, and stable occlusion, along with an improved facial profile.

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